

REMARKS

Claims 1 -26 are active in the present application. Reconsideration is respectfully requested.

The present invention relates to bisphosphines, to a process for making the same and to the use thereof in the preparation of Group VIII metal catalysts.

Amendment of Specification

The specification has been amended in several places to correct minor spelling errors in the text. Entry of the amendments is respectfully requested.

Claim Objections

The objection to Claims 1-26 concerning transitional language is not understood, because generic Claims 1, 4, 11 and 18 are all of proper form and, in fact, Claims 4, 11 and 18 contain the transitional term "comprising." As to the remaining claims, all are dependent claims that would not necessarily contain the transitional term "comprising." Accordingly, withdrawal of the objection to the claims is respectfully requested.

Amendment of the Claims

Claims 1, 2, 4, 5, 9, 11, 12, 16, 17 and 19-26 have been amended in order to make minor changes of language and form thereto.

Claims 1, 4 and 11 have been amended in order also to delete language therefrom that is not essential to define the scope of the claimed subject matter.

Claim 18, which is a process claim, has been amended in order to place the form of the claim into more conventional process claim language. No new matter is believed to have

been introduced into the claims by the amendments that have been made. Entry of the amendments into the claims is respectfully requested.

Claim Rejection, 35 USC 112

The rejection of Claim 3 is overcome by the amendments made to the claim.

It is acknowledged that Claims 18-26 are directed to a process for the production of aldehydes and that the claims make reference to the metal complex of Claim 11 which defines the catalyst that is used in the process of producing aldehydes. However, there is nothing improper about reciting that the catalyst employed in the process of Claim 18 is of a scope that is found in another claim. The fact that Claims 11 and 18 may be in different invention categories does not make Claim 18 indefinite. Accordingly, applicants have maintained the dependency of Claim 18 on Claim 11. Withdrawal of the rejection of Claims 18-26 is respectfully requested.

Invention

Claim 1 is drawn to a bisphosphine having the structure of formula (1) where the various substituent groups are as defined. A most significant structural feature of the claimed bisphosphine is that the two terminal phosphine moieties are linked together by a bis(methylenearylene)oxy group in which the central position of the molecule is occupied by an oxygen atom.

Prior Art Rejection, 35 USC 103

Claims 1-3 and 11-17 stand rejected based on 35 USC 103 as obvious over Bahrman et al, U. S. Patent 5,922,634. This ground of rejection is respectfully traversed.

The Bahrman et al document, in fact, describes rhodium/bisphosphine complexes that have been found to be useful in the hydroformylation of olefins to aldehydes. The bisphosphine ligand of the patent is shown at the top of column 3 where it is clear that two diarylphosphine groups are bonded directly to divalent radical R^2 , wherein an embodiment of radical R^2 is the linking unit defined as an oxygen-containing alkylene of 2 to 6 carbon atoms. (This linking group is not recited in Claim 1 of the patent.)

The Examiner states the view that the linking bisethylenoxy linking group disclosed by the reference has very close structural similarities to the claimed bisphosphine of the present invention. Applicants do not concur with this view, because the bivalent bis(methylenearylene)oxy group that links the two phosphorus atoms in the bisphosphine contains two arylene groups such as phenylene, naphthylene and anthracenylene that are directly attached to the sole oxygen atom of the group of the linking group. At the very least, because of the presence of these two arylene groups, the linking group is significantly longer than the linking group of the patent which at a maximum, besides the oxygen atom, contains only six carbon atoms. Moreover, the presence of the two arylene groups in the present linking group assures that the chemical characteristics of the linking group of the present bisphosphine are different from the chemical characteristics of the alkylene linking group of the bisphosphine of the patent. Accordingly, not only is the present bisphosphine significantly different from the bisphosphine of the patent, but also, as one of skill in the art would expect, the present Group VIII metal complex as claimed in Claims 11-17 would be expected to differ significantly in its characteristics, as a catalyst, from a corresponding metal complex made from the bisphosphine of the reference. Thus, the present invention as claimed is distinct from the disclosure of Bahrman et al and withdrawal of the rejection is respectfully requested.

Claims 4-10 stand rejected based on 35 USC 103 as obvious over Bahrman et al, U. S. Patent 5,922,634 in view of de la Mare et al, U. S. Patent 3,532,772. This ground of rejection is respectfully traversed.

As the Examiner has acknowledged, the Bahrman et al patent does not show or suggest the method of the present invention for preparing a bisphosphine. In Bahrman et al although a halogen terminated (both termini) reactant identified as $X-R^2-X$ is disclosed, nevertheless, the halogen compound is reacted with a diarylphosphine oxide, whereby $H-X$ is eliminated in the reaction to form a compound containing two terminal diarylphosphine oxide groups which subsequently are reduced by reaction with a silane compound. The Examiner then cites the de la Mare et al patent, because of its disclosure of an alkali metal phosphide. However, here the phosphide does not react in the manner of the process disclosed by Bahrman et al. Rather, the phosphide reactant appears to function in the manner of an anion in a living polymerization reaction, because the anionic compound acts as a catalyst for the polymerization of conjugated diene monomer or a vinylaromatic compound to yield polymer product. Actually, the catalyst is not the phosphide alone but an adduct of the phosphide with a chelating amine. Nevertheless, there is no connection whatever between the synthesis reaction of Bahrman et al and the catalyst of de la Mare et al which is used in an entirely different reaction which is that of initiating a polymerization reaction of olefinic compounds. The skilled artisan would not be motivated by either of the two references to select only the phosphide component of the phosphide catalyst of de la Mare et al and substitute it for the phosphine oxide reactant of the reaction system of Bahrman et al. In fact, it is clear that the Examiner in making the assertion of obviousness on the record has had to use the teachings of the present invention in hindsight which is improper, because where else is there a teaching of a phosphide anion in a reaction that results in the preparation of a bisphosphine?

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Accordingly, the present process as claimed is distinct from the combined disclosures of Bahrman et al and de la Mare et al and withdrawal of the rejection is respectfully requested.

It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "FD Vastine", with a long horizontal flourish extending from the end.

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